

CLAIMS

1. A lighting device having at least one light-emitting diode as a light source, the lighting device comprising:
 - a housing;
 - a reflector mounted at least partially in the housing;
 - at least one light-emitting diode mounted in the housing on a front side of the reflector, arranged so that at least a substantial majority of light output from the light-emitting diode is reflected off the surface of the reflector and past the light-emitting diode;
 - a supporting element arranged in-front of the reflector for supporting the light-emitting diode;
 - a protective filter or lens attached to the housing, protecting the light-emitting diode and reflector, and preventing soiling of the reflector; and
 - a focusing portion enabled to adjust a relative position between the light-emitting diode and the reflector, the relative position of the light-emitting diode and the reflector determining the beam spread projecting from the lighting device.
2. The lighting device of claim 1, wherein the supporting element is manufactured from a transparent material.
3. The lighting device of claim 1, wherein the supporting element is manufactured from a resilient material.
4. The lighting device of claim 1, wherein the supporting element is manufactured from a metal wire.

5. The lighting device of claim 1, wherein the supporting element is mounted to the housing in a location on a back side of the reflector, the supporting element passing through the reflector to the front side of the reflector.

6. The lighting device of claim 1, wherein the focusing portion comprises a linear actuator mounted in the protective filter or lens, substantially normal to the surface thereof, the linear actuator adjusting the distance between the light-emitting diode and the reflector, thereby adjusting the beam pattern of the lighting device.

7. The lighting device of claim 6, wherein the linear actuator is a screw, which, when turned in a first direction advances through the filter or lens, deflecting the supporting element and light-emitting diode toward the reflector.

8. The lighting device of claim 1, wherein the focusing portion comprises a screw mechanism arranged between the supporting element and the reflector, such that by rotating the supporting element in a first direction, the light-emitting diode is urged toward the reflector.

9. The lighting device of claim 8, wherein the screw mechanism is formed by at least two mating portions, a first mating portion being integral with the supporting portion.

10. The lighting device of claim 9, wherein a second mating is integral with the reflector

11. The lighting device of claim 9, wherein a second mating portion is integral with the housing.

12. The lighting device of claim 8, wherein the screw mechanism is formed by at least two mating portions, a first mating portion being integral with the lens or filter.

13. The lighting device of claim 12, wherein a second mating portion is integral with the housing.

14. The lighting device of claim 1, wherein the reflector is a parabolic reflector and the first side of the reflector is substantially concave.

15. The lighting device of claim 1, wherein the reflector is a hyperbolic reflector and the first side of the reflector is substantially convex.

16. The lighting device of claim 1, wherein the adjusting portion adjusts a lateral position between the light-emitting diode and the reflector, the reflector having an elongated shape with a substantially parabolic cross-section, the cross-section of the reflector varying along a length of the reflector, such that when the light-emitting diode travels along the length of the reflector, the varying cross-section results in a varying beam pattern.

17. A light-emitting diode light source comprising:
at least 1 light emitting diode; and
a reflector, the light emitting diode being aimed substantially toward the reflector, arranged such that light being emitted by the light emitting diode reflects off of the reflector and past the light emitting diode.

18. A lighting device comprising:

a parabolic reflector mounted within the lighting device, the reflector having a front side and a back side, the reflector having a central axis, about which the reflector is substantially symmetrical; and

a light emitting diode arranged on the front side of the reflector, the light emitting diode being arranged substantially along the central axis of the reflector and directed substantially toward the reflector, such that light emitted by the light emitting diode reflects off of the reflector and subsequently exits the lighting device.

19. A method for providing focusability to a light emitting diode lighting device, the method comprising:

mounting a light emitting diode in front of and substantially directed toward a reflector, light from the light emitting diode being reflected off of the reflector and past the light-emitting diode; and

adjusting a distance between the light-emitting diode and the reflector to adjust a beam spread emitted from the light-emitting diode lighting device.

20. A lighting device having a light-emitting diode as a light source, the lighting device comprising:

a housing;

a reflector mounted in the housing;

a light-emitting diode mounted in the housing on a first side of the reflector, located substantially at a central axis of the reflector, the light-emitting diode arranged so that at least a substantial majority of light output from the light-emitting diode is reflected off the surface of the reflector and past the light-emitting diode;

a supporting element arranged in-front of the reflector for supporting the light-emitting diode; and

a protective filter or lens attached to the housing, protecting the light-emitting diode and reflector, and preventing soiling of the reflector.

21. A light-emitting diode light source comprising:

a housing;

a light emitting diode arranged substantially in the housing;

a supporting portion for supporting the light emitting diode within the housing, the supporting portion being substantially rigidly attached to the light emitting diode, such that when the supporting portion is moved or deformed, the light emitting diode moves respectively;

a reflector arranged at least partly within the housing, the light emitting diode being aimed substantially toward the reflector and arranged such that light being emitted by the light emitting diode reflects off of the reflector, past the light emitting diode.